

Claims

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1. A heating/air-conditioning installation for a motor vehicle, comprising, on the one hand, a thermal loop which includes a refrigerating compressor, a gas cooler, especially a condenser, a pressure-reducing valve and an evaporator, and, on the other hand, a heating element, wherein the gas cooler and the heating element are grouped together into a single exchanger including a main module forming a main air/heat-carrying fluid/refrigerant-fluid exchanger.

2. The installation of Claim 1, wherein the said main exchanger exhibits:

- at least one surface for exchanging between the air and the heat-carrying fluid flowing through the main exchanger

- at least one surface for exchanging between the heat-carrying fluid and the refrigerant fluid of the main loop flowing through the main exchanger.

3. The installation of Claim 2, wherein the said main exchanger consists of a stack of modules each of which includes:

- an element for exchanging between the heat-carrying fluid and the refrigerant fluid, having at least one surface in thermal contact with an element for exchanging with the air; and

- the said element for exchanging with the air.

4. The installation of Claim 3, wherein the said element for exchanging between the heat-carrying fluid and the refrigerant fluid successively exhibits:

- a first heat-carrying fluid circulation element;

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- a refrigerant-fluid circulation element having a first surface in thermal contact with a first surface of the first heat-carrying fluid circulation element, and a second surface in contact with a first surface of a second heat-carrying fluid circulation element;

- the said second water circulation element, and in that the said element for exchanging with the air exhibits a first surface for exchanging with a second surface of the second heat-carrying fluid circulation element and a second surface for exchanging with a second surface of the first heat-carrying fluid circulation element of an adjacent module.

5. The installation of Claim 3, wherein the said modules also exhibit at least one surface for exchanging between the air and the refrigerant liquid flowing through the main exchanger.

6. The installation of Claim 5, wherein the said element for exchanging between the heat-carrying fluid and the refrigerant liquid successively exhibits:

- a third heat-carrying fluid circulation element having a first surface in thermal contact with a second refrigerant-fluid circulation element

- the said second refrigerant-fluid circulation element.

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7. The installation of Claim 1, wherein the said main exchanger exhibits:

- at least one surface for exchanging between the air and the refrigerant liquid

- at least one surface for exchanging between the heat-carrying fluid and the refrigerant fluid.

8. The installation of claim 1, wherein the said main exchanger includes a collector of heat-carrying

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fluid and a collector of the refrigerant liquid which are arranged at opposite ends of the main exchanger.

9. The installation of Claim 8, wherein the element for exchanging between the heat-carrying fluid and the refrigerant liquid exhibits at least one heat-carrying fluid circuit element for making the heat-carrying fluid circulate along an outwards and return path from and to the heat-carrying fluid collector and at least one refrigerant-liquid circuit element for making the refrigerant fluid circulate along an outwards and return path from and to the refrigerant-fluid collector.

10.) The installation of Claim 9, wherein the circulations of the refrigerant fluid and of the heat-carrying fluid currents are at least partly counter to each other.

11. The installation of Claim 8, wherein the refrigerant-liquid collector exhibits an element of volume forming a refrigerant-liquid bottle for the thermal loop.

12. The installation of Claim 11, wherein the said bottle is made of extruded metal.

13. The installation of Claim 12, wherein the refrigerant-fluid collector and the bottle are co-extruded.

14. The installation of claim 1, wherein the said exchanger includes an auxiliary module forming an auxiliary heat-carrying fluid/refrigerant fluid exchanger which is traversed by the refrigerant fluid and by a heat-carrying cooling fluid, and which is

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intended to serve as a sub-cooling exchanger for the refrigerant fluid and/or as evaporator for a heat pump.

15. The installation of Claim 14, wherein the said auxiliary module includes a stack of heat-carrying fluid/refrigerant fluid exchange modules.

16. The installation of Claim 14, wherein the thermal loop exhibits a first routing circuit in order, in heating mode, to form a heat pump the condenser of which is the said main exchanger and the evaporator of which is the said auxiliary exchanger.

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17. The installation of Claim 1, wherein the thermal loop exhibits an additional evaporator for operation in heating mode, and a second routing circuit in order, in heating mode, to form a heat pump the condenser of which is the said main exchanger and the evaporator of which is an additional evaporator.

18. The installation of Claim 1, wherein the thermal loop exhibits a third routing circuit in order, in a thermal heating mode, to form a heating loop including the compressor and the main exchanger, the refrigerant-fluid outlet of the main exchanger being coupled to the inlet of the compressor.

19. The installation of Claim 18, wherein it includes a pressure-reducing valve arranged downstream of the main exchanger.

20. The installation of Claim 1, wherein the thermal loop includes a supply device for supplying the main exchanger either with cooling water, or with overcooled water.

21. The installation of Claim 20, wherein it exhibits:

- an air-conditioning mode in which the main exchanger is traversed by refrigerant liquid and by overcooled water,

- a heating mode in which the main exchanger is traversed by cooling water.

22. The installation of Claim 21, wherein it exhibits a mixing flap which, in the air-conditioning mode, is in a closed position in which the main exchanger is isolated from the airflow.

23. The installation of Claim 22, wherein it exhibits a de-misting mode in which the air-conditioning mode is activated, and in which the mixing flap is in an at least partially open position, so that the main exchanger is traversed by at least a part of the airflow.

24. The installation of Claim 1, wherein it exhibits a preassembled module including the said main exchanger, the said evaporator, at least one air duct, as well as air mixing and/or distribution means.

25. The installation of Claim 24, wherein the preassembled module includes the said refrigerating compressor and/or the pressure-reducing valve, and/or an electric pump and/or a bottle of refrigerant fluid.

26. The installation of Claim 25, wherein the preassembled module includes a structural element of the vehicle and/or a steering column and/or an inflatable bag and/or a pedal assembly.

27. The installation of Claim 24, wherein the preassembled module includes a motor and drive members

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for the windscreen wipers of the vehicle, and/or a water separator for an air intake into the passenger compartment, and/or at least one air-cleaner filter housing and/or at least one display element.

28. The installation of Claim 24, wherein the preassembled module exhibits the said thermal loop and in that the latter is assembled in a leaktight manner.

29. Driver's position of a motor vehicle, wherein it includes an installation of Claim 1. ?

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